Chapter 1

Understanding ecosystems

Ecosystems

- An ecosystem is an area of the Earth's surface where non-living (abiotic) parts of the Earth and biotic organisms interact.
- Ecosystems have both living and non-living components. All these parts work together, with 'inputs' to make them function and 'outputs' – waste material resulting from the processes required to keep the ecosystem functioning.

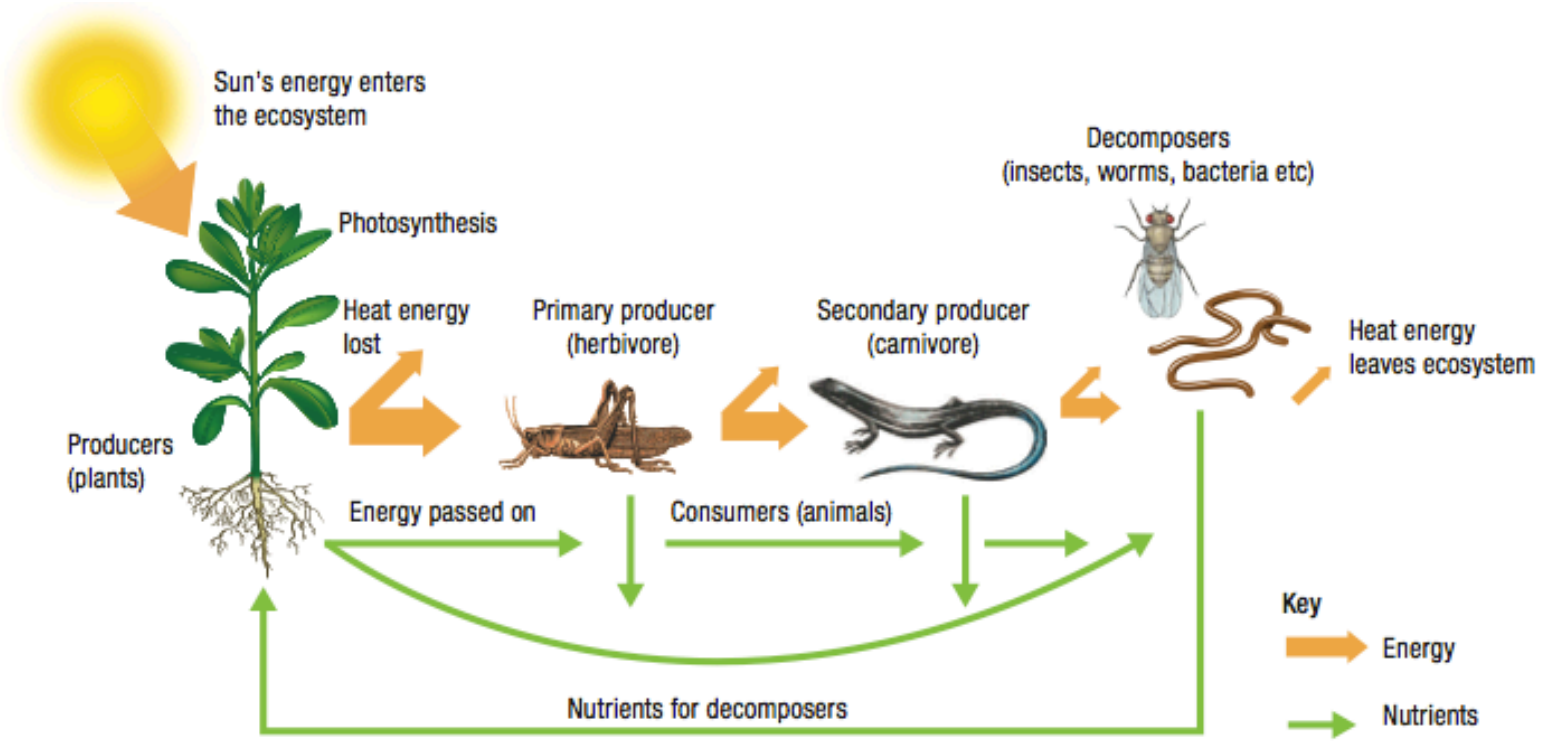
Abiotic components

- **Sunlight** – received from the sun, and crucial to plant growth.
- **Temperature** – changes in the air temperature on daily basis.
- **Wind** – can influence the germination of plants and the flight of birds from ecosystem to ecosystem.
- **Rainfall** – precipitation that falls from the sky.
- **Rocks** – the basis of all ecosystems.

Biotic components

- **Flora** – plant life.
- **Fauna** – animal life.
- **Fungi** – organisms that grow in low moisture.

Ecosystem diagram



The sun and the abiotic environment: weather

Weather refers to the day-to-day changes in the atmosphere.

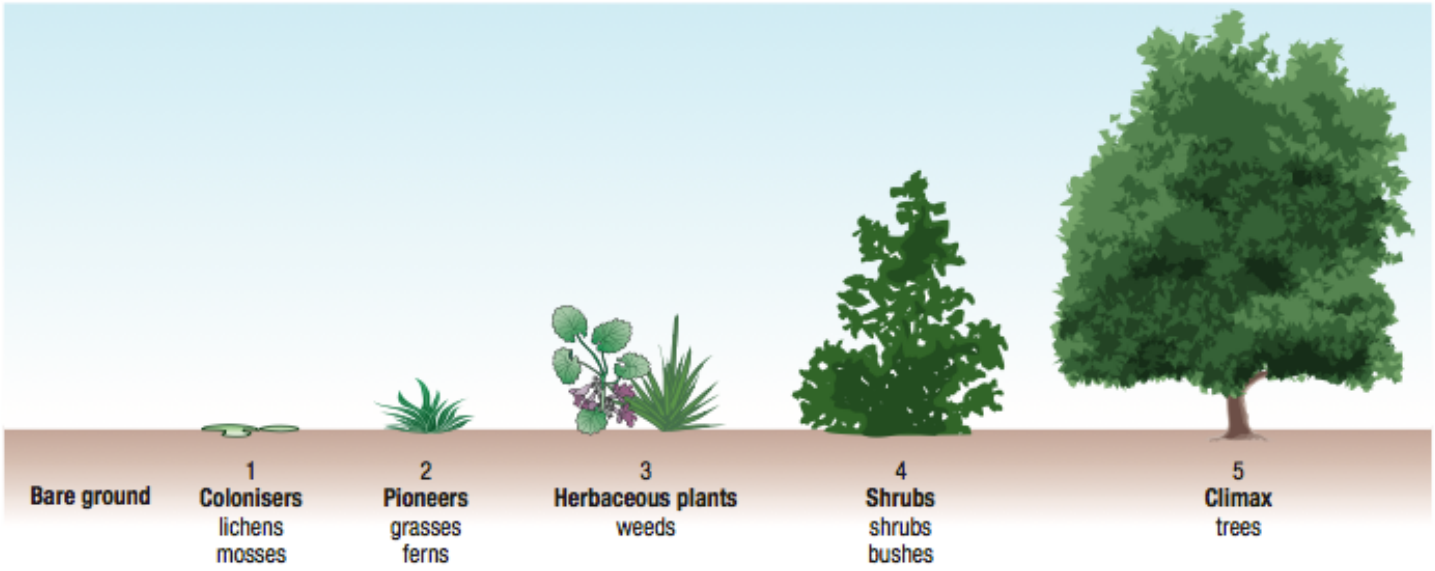
- Temperature:
  - heats up the land and water surfaces
  - creates evaporation (a major component of the water cycle)
  - creates precipitation (rain).
- Wind: the movement of air from an area of high pressure to an area of low pressure. One of the earliest forms of wind measurement was the Beaufort Scale.

The sun and the abiotic environment: rocks and soil

- Temperature changes from the heat of the sun are a major cause of mechanical or physical weathering. For example, different parts of rocks heating up and expanding at different rates or water in the cracks freezing over night causing the rock to break up from the expanding ice.

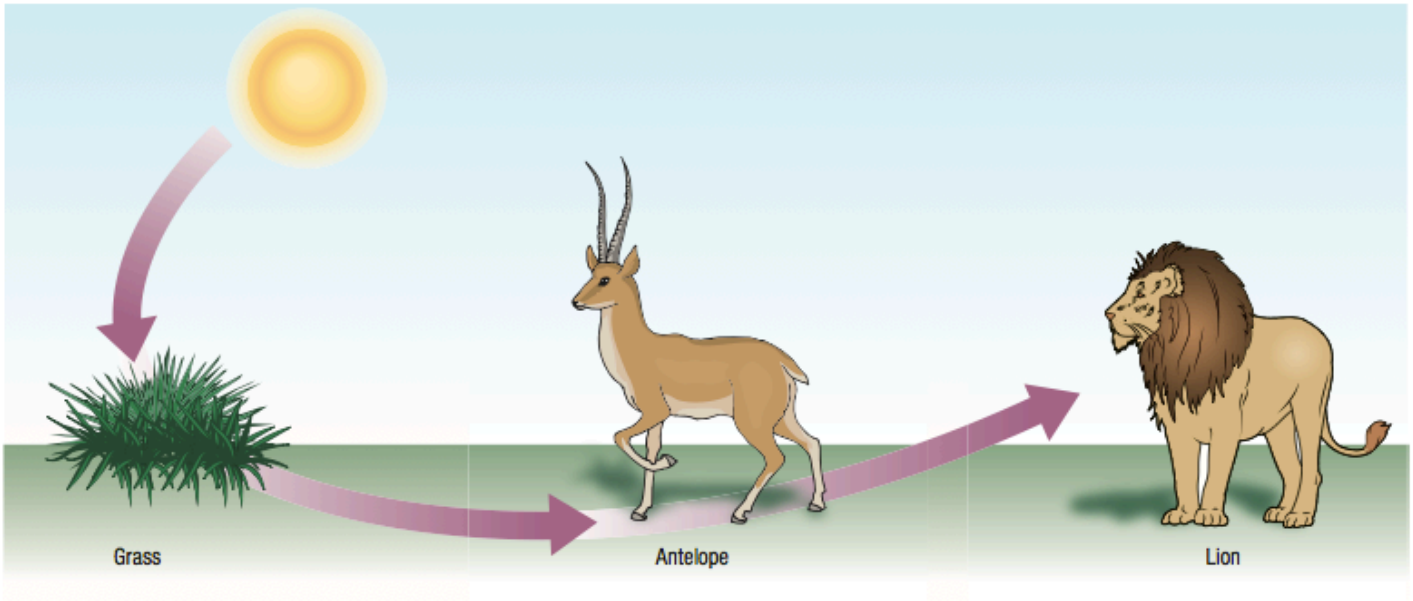
The sun and the biotic environment: flora and fauna

The following source shows how plant communities change over time: the character of an ecosystem changes as a result of its earlier plant communities.



The sun and the biotic environment: flora and fauna

For fauna, the way the sun influences the environment can be best understood by analysing a basic food chain.



Introducing another variable: humans

- Humans have had a major impact on ecosystems on the Earth's surface and that impact is increasing.
- Humans have been altering ecosystems for thousands of years. Increasing populations required more food than could be provided by hunting and gathering. Providing more food required clearing land of its vegetation cover.

Introducing another variable: humans (cont.)

- Saving and protecting ecosystems is regarded as important.
- An international network of botanical gardens and zoos seeks to protect and enhance the future of plant and animal species that are under threat.
  - The world's first national park, Yellowstone National Park in the United States, was opened on 1 March 1872.
  - Australia's first national park was the National Park, south of Sydney. It was opened on 26 April 1879. It was the world's second national park.